

# इंटरनेट

# मानक

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IS 4752 (1994): Sodium Metabisulphite, Food Grade [FAD 8: Food Additives]



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“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक

सोडियम मैटाबाईसल्फाइट, खाद्य ग्रेड — विशिष्टि  
( पहला पुनरीक्षण )

*Indian Standard*

**SODIUM METABISULPHITE, FOOD  
GRADE — SPECIFICATION**

*( First Revision )*

First Reprint NOVEMBER 1997

UDC 664.099.4 : 546.332.24

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Additives Sectional Committee had been approved by the Food and Agriculture Division Council.

With the increased production of processed foods, manufacturers have started adding a large number of substances, generally in small quantities, to improve the appearance, flavour, texture or storage properties of the processed foods. As certain impurities in these substances have been found to be harmful, it is necessary to have a strict quality control of these food additives. A series of standards is, therefore, being prepared by this Bureau to cover purity and identification of these substances. It is hoped that these standards would help in checking purity which requires to be checked at the stage of manufacture, for it is extremely difficult (and in many cases impossible) to detect the impurity once these substances have been added to the processed foods. Besides, these standards are intended to guide the indigenous manufacturers in making their product conform to specification that are accepted by scientists, health authorities and international bodies.

Sodium metabisulphite widely used as food preservative, is permitted under the *Prevention of Food Adulteration Rules, 1955*, as well as *Fruit Products Order, 1955*.

**Chemical Names and Formula** — The recognized chemical names are sodium metabisulphite and sodium pyrosulphite. Chemical formula is  $\text{Na}_2\text{S}_2\text{O}_5$ . Its molecular weight is 190.11.

This standard was first published in 1968. It is being revised to take into consideration the requirements given in the following International as well as EEC Standards.

FAO Food and Nutrition Paper No. 4 Specification for identity and purity of thickening agents, anticaking agents, antimicrobials, antioxidants and emulsifiers; published by the Joint FAO/WHO Expert Committee on Food Additives, Rome 1978.

Food Chemical Codex, 1981 Pub. National Academy of Sciences, and National Research Council, Washington DC, USA.

Council Directive 65/66/EEC of 26 January 1965 laying down specific criteria of purity for preservatives authorized for use in foodstuffs intended for human consumption.

In this revision, solubility has been brought under description and as given under Note of 3.1, it is intended only as information regarding approximate solubility and is not to be considered as a quality requirement. The limit of thiosulphate has been made more stringent and the requirement for lead has been substituted by heavy metals.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# Indian Standard

## SODIUM METABISULPHITE, FOOD GRADE — SPECIFICATION

( *First Revision* )

### 1 SCOPE

This standard prescribes the requirements and the method of sampling and test for sodium metabisulphite for use as a food preservative.

### 2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard :

<i>IS No.</i>	<i>Title</i>
1070 : 1992	Reagent grade water ( <i>third revision</i> )
1699 : 1994	Methods of sampling and test for food colours ( <i>second revision</i> )
4447 : 1994	Sodium benzoate, food grade ( <i>first revision</i> )
4751 : 1994	Potassium metabisulphite, food grade ( <i>first revision</i> )

### 3 REQUIREMENTS

#### 3.1 Description

The material shall be colourless crystals or white to yellowish crystalline powder having an odour of sulphur dioxide. The material is soluble in water but insoluble in ethanol.

NOTE — The solubility is intended only as information regarding approximate solubility and is not to be considered as a quality requirement and is of minor significance as a means of identification or determination of purity and dependence must be placed on other specifications.

#### 3.2 Identification Test

**3.2.1** Aqueous solution of the material shall be acidic to a solution of phenol red.

**3.2.2** Aqueous solution of the material shall decolourize a solution of iodine.

**3.2.3** Ten percent solution of the material shall give positive test for sodium given in 3.2.3.1 and positive test for a sulphite given in 3.2.3.2.

##### 3.2.3.1 *Test for sodium*

When uranyl zinc acetate is added to the solution, yellow crystalline precipitate shall be formed with several minutes agitation.

##### 3.2.3.2 *Test for sulphite*

When dilute sulphuric acid is added to the solution, sulphur dioxide shall be produced which may be recognized by its characteristic odour, or by blackening of filter paper moistened with mercurous nitrate or by the development of a blue colour on filter paper treated with potassium iodate and starch.

### 3.3 Water Insolubles

Twenty grams of the material when dissolved in 200 ml of water shall give a clear solution with only a trace of suspended matter.

**3.4** The material shall also conform to the requirements given in Table 1.

### 4 PACKING, STORAGE AND MARKING

#### 4.1 Packing

The material shall be securely packed in well-filled containers with a minimum access to air and light. The containers shall be such as to preclude contamination of the contents with metals or other impurities.

#### 4.2 Storage

The material shall be stored in a cool and dry place so as to avoid excessive exposure to heat.

#### 4.3 Marking

**4.3.1** Each container shall be legibly and indelibly marked with the following information:

- a) Name of the material, including the words 'Food Grade';
- b) Source of manufacture;
- c) Date of manufacture;
- d) Minimum net contents;
- e) Batch or code number; and
- f) Any other requirements as given under the *Standards of Weights and Measures (Packaged Commodities) Rules, 1977/Prevention of Food Adulteration Rules, 1955.*

**Table 1 Requirements for Sodium Metabisulphite**  
(Clause 3.4)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Purity		Annex A
	a) as Na <sub>2</sub> S <sub>2</sub> O <sub>5</sub> , percent by mass, <i>Min</i>	95	
	b) as SO <sub>2</sub> , percent by mass, <i>Min</i>	64	
ii)	Water insoluble matter, percent by mass, <i>Max</i>	0.05	Annex B
iii)	Thiosulphate, percent by mass, <i>Max</i>	0.1	Annex C of IS 4751 : 1994
iv)	Arsenic (as As), mg/kg, <i>Max</i>	3	Cl 15 of IS 1699 : 1994
v)	Heavy metals (as Pb), mg/kg, <i>Max</i>	10	Annex C
vi)	Iron (as Fe), mg/kg, <i>Max</i>	5	Annex D
vii)	Selenium (as Se), mg/kg, <i>Max</i>	30	Annex E of IS 4751 : 1994
viii)	pH	Acidic to litmus	—

#### 4.3.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

**4.3.2.1** The use of the Standard Mark is governed by the Provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Council Directive 65/66/EEC of 26 January 1965 laying down specific criteria of purity for preservatives authorized for use in foodstuffs intended for human consumption.

#### 5 SAMPLING

Representative samples of the material shall be drawn according to the methods prescribed in 4 of IS 1699 : 1994.

#### 6 TESTS

**6.1** Tests shall be carried out by the methods as specified in 3.2, 3.3 and col 4 of Table 1.

#### 6.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (see IS 1070 : 1992) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the experimental results.

### ANNEX A

[ Table 1, Sl No. (i) ]

#### DETERMINATION OF PURITY

##### A-1 REAGENTS

##### A-1.1 Standard Iodine Solution — 0.1 N.

##### A-1.2 Concentrated Hydrochloric Acid

##### A-1.3 Standard Sodium Thiosulphate Solution — 0.1 N.

##### A-1.4 Starch Solution

Mix 1 g of starch and 10 mg of red mercuric iodide and sufficient cold water to make a thin paste. Add 200 ml of boiling water, boil for 1 minute with

continuous stirring and cool. Use only the clear solution.

##### A-2 PROCEDURE

**A-2.1** Weigh accurately about 0.200 g of the material and add it to 50 ml of standard iodine solution, contained in a glass stoppered flask, and stopper the flask. Allow it to stand for 5 minutes, add 1 ml of concentrated hydrochloric acid and titrate the excess iodine with standard sodium thiosulphate solution, adding starch solution as the end point is reached. Each ml of 0.1 N iodine is equivalent to 0.004 752 g of Na<sub>2</sub>S<sub>2</sub>O<sub>5</sub>.

## ANNEX B

[Table 1, Sl No. (ii)]

## DETERMINATION OF WATER INSOLUBLE MATTER

## B-1 PROCEDURE

**B-1.1** Dissolve about 10 g of the material, accurately weighed, in 50 ml of water. Filter through a weighed Gooch crucible fitted with an asbestos pad or through a weighed sintered glass crucible (G No. 4), previously washed and dried at 105 to 110°C and wash well with water. Dry the residue to constant mass at 105 to 110°C.

$$\text{B-1.2 Matter insoluble in water, percent by mass} = \frac{100 M_1}{M_2}$$

where

 $M_1$  = mass, in g, of the residue; and $M_2$  = mass, in g, of the material taken for the test.

## ANNEX C

[ Table 1, Sl No. (v) ]

## DETERMINATION OF HEAVY METALS

## C-1 PROCEDURE

Dissolve 1 g of sodium metabisulphite in 10 ml of water, add 5 ml of hydrochloric acid, evaporate to dryness on a steam bath and dissolve the residue

in 25 ml of water. This solution meets the requirements of heavy metal test as given in Annex J of IS 4447 : 1994 using 20 mcg of lead ion (Pb) in the control (*solution A*).

## ANNEX D

[ Table 1, Sl No. (vi) ]

## DETERMINATION OF IRON

## D-1 REAGENTS

## D-1.1 Bromine Solution

Prepare saturated solution of bromine by agitating 2 to 3 ml of bromine with 100 ml of cold water in a glass stoppered bottle, the stopper of which should be lubricated with petroleum. Store in a cool place and protect from light.

## D-1.2 Hydrochloric Acid

## D-1.3 Ammonium Persulphate

## D-1.4 Ammonium Thiocyanate Solution

Dissolve 8 g of ammonium thiocyanate ( $\text{NH}_4\text{CNS}$ ), in sufficient water to make 100 ml.

**D-1.5** Standard Iron Solution — 10 mcg. Fe.

## D-2 PROCEDURE

**D-2.1** To 500 mg of the sample add 2 ml of hydrochloric acid and evaporate to dryness on a steam-bath. Dissolve the residue in 2 ml of hydrochloric acid and 20 ml of water, add a few drops of bromine solution, and boil the solution to remove the bromine. Cool, dilute with water to 25 ml, then add 50 mg of ammonium persulphate and 5 ml of ammonium thiocyanate solution. Any red or pink colour does not exceed that produced in a control containing 1.0 ml of standard iron solution (10 mcg. Fe).



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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'.

This Indian Standard has been developed from Doc: No. FAD 8 ( 312 ).

### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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**AMENDMENT NO. 1 MARCH 2005**  
**TO**  
**IS 4752 : 1994 SODIUM METABISULPHITE, FOOD**  
**GRADE — SPECIFICATION**

*( First Revision )*

*( Second cover, Foreword )* — Insert the following before the last para:

‘A scheme for labelling environment friendly products known as ECO-Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act*, 1986 as per the Resolution No. 71 dated 20 February 1991 as published in the Gazette of the Government of India vide GSR No. 85 (E) dated 21 February 1991. For a product to be eligible for marking with the ECO-Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional environmental friendly (EF) requirements. The EF requirements for sodium metabisulphite are, therefore, being included through Amendment No. 1 to this standard.

This Amendment is based on Gazette Notification No. 215 (E) dated 17 May 1996 for labelling Food Additives as environment friendly products, published by the Ministry of Environment and Forests.’

*( Page 1, clause 2 )* — Substitute ‘1699 : 1995’ for ‘1699 : 1994’.

*( Page 1, clause 3.4 )* — Insert the following new clause after 3.4:

**‘3.5 Additional Requirements for ECO-Mark**

**3.5.1 General Requirements**

**3.5.1.1** The product shall conform to the requirements prescribed under 3.1 to 3.4.

**3.5.1.2** The product manufacturer shall produce the consent clearance as per the provisions of *Water (Prevention & Control of Pollution) Act*, 1974, *Water (Prevention & Control of Pollution) Cess Act*, 1977 and *Air (Prevention & Control of Pollution) Act*, 1981 along with the authorization, if required, under *Environment (Protection) Act*, 1986 and the Rules made thereunder to Bureau of Indian Standards while applying for the ECO-Mark; and the product shall also be in accordance with the *Prevention of Food Adulteration Act*, 1954 and the Rules made thereunder.

## **Amend No. 1 to IS 4752 : 1994**

**3.5.1.3** The product/packing shall display in brief the criteria based on which the product has been labelled as environment friendly.

**3.5.1.4** The material used for product packaging shall be recyclable or biodegradable.

**3.5.1.5** The date of manufacture and best before date shall be declared on the product package by the manufacturer.

**3.5.1.6** The product package or leaflet accompanying it may display instructions of proper use and storage so as to maximize the product performance, safety and minimize wastage.

### **3.5.2 Specific Requirements**

**3.5.2.1** In Table 1, the requirement for arsenic specified under Sl No. (iv) shall be not more than 1.5 ppm in place of the existing for the product to be eligible for the ECO-Mark.'

[ *Page 2, Table 1, Sl No. (iv), col 4* ] — Substitute 'Cl 15 of IS 1699 : 1995' for 'Cl 15 of IS 1699 : 1994'.

[ *Page 2, Table 1, Sl No. (vii), col 3* ] — Substitute '5' for '30'.

( *Page 2, Table 1* ) — Insert the following at the end of the table:

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
ix)	Lead (as Pb), mg/kg, <i>Max</i>	2	15 of IS1699 : 1995

( *Page 2, clause 4.3.2.1* ) — Insert the following new clause after **4.3.2.1**:

### **'4.3.3 ECO-Mark**

The product may also be marked with the ECO-Mark, the details of which may be obtained from Bureau of Indian Standards.'

( *Page 2, clause 5, line 3* ) — Substitute 'IS 1699 : 1995' for 'IS 1699 : 1994'.

(FAD 8)